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DIVISION OF MYCOLOGY AND DISEASE SURVEY

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The spread of white pine blister rust in 1941 is reported by the Division of Plant Disease Control of the Bureau of Entomology and Plant Quarantine, page 76.

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CHECK LIST REVISION

Freeman Weiss

PSEUDOLARIX (PINACEAE)

PSEUDOLARIX AMABILIS (Nels.) Rehd., GOLDENLARCH. Deciduous tree of China, cult. for ornament, Zone V.

Dasyscypha willkommii (Hartig) Rehm, canker. Mass.

PSEUDOTSUGA (PINACEAE)

PSEUDOTSUGA MACROCARPA (Torr.) Mayr, BIGCONE-SPRUCE. Large evergreen tree of Growth Regions 4, 5, 10.

Melampsora albertensis Arth., needle rust (0,I). Calif. II and III on Populus spp.
Phytomonas pseudotsugae (Hansen & R.E.Smith) Bergey et al., bacterial gall. Calif.

P. TAXIFOLIA (Poir.) Rehd., DOUGLAS-FIR. Large evergreen tree, very variable, existing in several geographic forms, sometimes distinguished as 3 botanical vars., or 2 spp. and 1 var. The coast form, var. VIRIDIS (Schwer.) Aschers. & Graebn., occurs in Growth Regions 1, 2, 3, 4, 5, 6; the intermountain form, var. CAESIA (Schwer.) Aschers. & Graebn., occurs in G.R.'s 6, 7, 12; their cult. zone limit is VI. The mountain form, var. GLAUCA (Mayr) Schneid., occurs in G.R.'s 9, 11, 13, 14, 16, and is hardy in Zone IV.

(Adelopus gäumanni Rohde): Phaeocryptopus gäumanni.
Aleurodiscus spp., on bark, sometimes weakly parasitic. A. amorphus (Pers.) Rabh., widespread; A. subcruentatus (Berk. & Curt.) Burt, Calif. & Oregon; and others.
Arceuthobium douglasii Engelm., dwarf mistletoe, witches'-broom. Mont. to Colo. and eastern Oregon & Wash.
Armillaria mellea Vahl ex Fr., root rot. Cosmopolitan.
Botrytis cinerea Pers. (B. douglasii Tub.), gray mold twig blight, snow mold of seedlings. Cosmopolitan.
Ceratostomella pseudotsugae Rumbold, sapwood stain. Oregon, Wash.
Chondropodium pseudotsugae White, bark canker. Oregon.
Cryptosporium boycei Dearn., bark canker (secondary). Wash.
Cytospora sp., twig canker. (Conidial stage of Valsa abietis ?) Colo., N.J. (cult.), Oregon.
Dasyschypha ellisiana (Rehm) Sacc., twig canker. Mass., N.Car., R.I.
D. pseudotsugae Hahn, branch & trunk canker. Calif. to Wash. (Other Dasyscypha spp. are saprophytic on branches & twigs, as D. agassizii (Berk. & Curt.) Sacc., D. arida (Phill.) Sacc., and D. ciliata Hahn in the West; D. calycina Fckl. in Mass. & R.I.; D. oblongospora Hahn & Ayers in the N.E. States.)

PSEUDOTSUGA -- Continued.

(Diplodia pinea (Desm.) Kickx): Sphaeropsis ellisii
Echinodontium tinctorium (Ell.) Ell. & Ev., brown stringy heart rot. Mont. to Utah and Wash.
Endoconidiophora coerulescens Münch, sapwood stain. Calif.
Fomes annosus (Fr.) Cke., brown root & butt rot, white pocket rot. Mont. to Oregon & Wash.
F. applanatus (Pers. ex Fr.) Gill., white mottled root & butt rot. Mont. to Oregon & Wash.
F. officinalis (Vill. ex Fr.) Faull (F. laricis (Jacq.) Murr.), reddish brown trunk rot. Mont. to Calif. & Wash.
F. pini (Brot. ex Fr.) Karst. (Trametes pini Brot. ex Fr.), red ring rot, white pocket heart rot. Widespread.
F. pinicola (Sw. ex Fr.) Cke., brown cubical trunk rot. Widespread.
F. putearius Weir (= F. nigrolimitatus Romell ?), white pocket rot. Mont., Wash.
F. roseus (Alb. & Schw. ex Fr.) Cke., yellow-brown trunk rot, brown cubical rot. Widespread.
F. subroseus (Weir) Overh., brown cubical rot. Widespread.
Fusarium spp., seed rot, damping off. F. moniliforme Sheldon and F. solani (Mart.) App. & Wr. among others, shown pathogenic. Cosmopolitan.
Ganoderma oregonense Murr., white pocket rot. Mont., Wash.
Herpotrichia nigra Hartig, brown felt blight. Rocky Mts. and Pacific Northwest.
Hydnum coralloides Scop. ex Fr., white pocket rot, sometimes on living trees. Pacific Northwest.
Lentinus lepideus Fr., brown cubical rot of logs & timber, sometimes heart rot of living trees. Pacific Northwest.
Lenzites saepiaria Wulf. ex Fr. and L. trabea Pers. ex Fr., brown sapwood rot of slash & logs. Widespread.
Leptothyrium pseudotsugae Dearn., flyspeck, on needles. Colo.
Melampsora albertensis Arth. (Caeoma occidentale Arth.), needle rust (O, I). Mont. to Colo., Utah, & Wash. II and III on Populus spp.
Phacidium infestans Karst., snow blight. Idaho.
Phaeocryptopus gäumanni (Rohde) Petr. (Adelopus gäumanni Rohde), needle cast. Endemic but noninjurious in the Pacific Coast States, usually on the coast form (var. viridis), infrequently on the intermountain and mountain forms; pathogenic to planted Douglas-firs in the N.E. States. (The spelling gäumanni was used in the original description, and gaeumanni in the above combination; neither name accords fully with the recommendations under International Rules.)
Phoma (Sclerophoma) douglasii Oud., on twigs. Colo.
Phomopsis lokoyae Hahn, stem canker. Pacific Coast States. Only on the var. viridis.
P. occulta Trav., on dead twigs. Widespread. Conidial stage of Diaporthe conorum (Desm.) Niessl.
Phyllosticta sp., on needles. Oregon.

PSEUDOTSUGA -- Continued.

Phytomonas pseudotsugae (Hansen & R.E.Smith) Bergey et al., bacterial gall. Calif.

Polyporus spp., rot of trunks, logs & slash, characteristically white pocket or spongy; sometimes sapwood or heart rot of living trees. Occasional to general in range of host. Spp. reported include P. abietinus Dicks. ex Fr., P. adustus Willd. ex Fr., P. alboluteus Ell. & Ev., P. amorphus Fr., P. fibrillosus Karst., P. guttulatus Pk., P. hirsutus Wulf. ex Fr., P. leucospongia Cke. & Harkn., P. resinosus Schrad. ex Fr., P. versicolor L. ex Fr., P. volvatus Pk.

P. anceps Pk. (P. ellisianus (Murr.) Long), red-ray heart rot. Idaho, Wash.

P. circinatus Fr., root & butt rot, white pocket heart rot. Idaho.

P. schweinitzii Fr., reddish brown root, butt and heart rot. Widespread, including planted Douglas-firs in the East.

P. sulphureus Bull. ex Fr., brown cubical heart rot. Widespread.

Poria spp., rot of logs & slash. Occasional throughout range of host. Spp. reported include P. cinerescens Bres., P. dichroa Bres., P. lenis Karst., P. purpurea (Fr.) Cke., P. subacida (Pk.) Sacc., P. weirii Murr., P. xantha (Fr.) Lind.

P. incrassata (Berk. & Curt.) Burt, dry rot of timber. Pacific Northwest.

Pucciniastrum goeppertianum (Kühn) Kleb., needle rust (O,I). Mont. III on Vaccinium spp.

Pythium ultimum Trow., damping off. Colo.

Rhabdocline pseudotsugae Syd. (Rhabdogloeum pseudotsugae Syd.), needle cast. Pacific Northwest, also Ariz., Colo. & Calif., probably general in range of host; Mass., N.Y., R.I. (cult.). Occurs on both coast & intermountain forms, especially the latter.

Rhizina undulata Fr., seedling blight. Pacific Northwest.

Rhizoctonia solani Kühn, damping off. Cosmopolitan.

Sparassis radicata Weir, yellow mottled root rot. Pacific Northwest.

Sphaeropsis ellisii Sacc., dieback, collar rot, seedling blight. Calif., Kans., N.J., N.Y.

Stereum spp. (S. chailletii Pers. ex Fr., S. sanguinolentum Alb. & Schw. ex Fr., S. sulcatum Burt.), white pocket rot of logs & slash. Pacific Northwest.

Thelephora terrestris Ehrh. ex Fr., smothering of seedlings. Pacific Northwest.

Trametes spp., rot of logs & timber. Pacific Northwest. Spp. reported include T. americana Overh., T. heteromorpha (Fr.) Lloyd, T. hispida Bagl., T. isabellina Fr., T. serialis Fr.

Valsa abietis Fr., on twigs & branches. Colo., Oregon, Wash.

PSIDIUM (MYRTACEAE)

PSIDIUM GUAJAVA L., COMMON GUAVA. Shrub or small tree of tropical America, widely cult. for fruit in warm regions, naturalized in Hawaii. Several other spp. also are cult. especially P. CATTLEIANUM Sabine, STRAWBERRY GUAVA.

PSIDIUM -- Continued.

Asterina psidii Ryan, black patch. P.R.
Botryosphaeria ribis var. chromogena Shear et al., on branches. Fla., T.H.
Caudella psidii Ryan, black patch. P.R.
Cephaleuros virescens Kze., green scurf, algal spot. Fla., P.R.
Cercospora psidii Rangel, leaf spot. Fla.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Colletotrichum gloeosporioides Penz., anthracnose. Conidial stage of Glomerella cingulata.
Corticium stevensii Burt, thread blight. Fla.
Glomerella cingulata (Ston.) Spauld. & Schrenk (G. psidii (Del.) Sheldon), anthracnose, leaf & fruit spot, ripe rot. Fla., P.R., T.H.
Heterodera marioni (Cornu) Goodey, root knot. Fla.
Meliola psidii Fr., black mildew. P.R., Canal Zone.
Polyporus versicolor L. ex Fr., wound rot. Calif.
Puccinia psidii Wint., rust (II). P.R.
Trametes corrugata Pers. ex Bres., wood rot. T.H.
Trichomerium portoricense Speg., on leaves. P.R.

PSYCHOTRIA (RUBIACEAE)

PSYCHOTRIA spp., WILD-COFFEE. Tropical shrubs or trees; S. NERVOSA Sw., BALSAMO and S. UNDATA Jacq. occur in S. Fla. and West Indies, sometimes planted for ornament.

Asterina acanthopoda Speg. and A. psychotriae Ryan, black patch. P.R.
Irene seminata (Berk. & Curt.) Seaver & Chardon, black mildw. P.R.
Irenina isertiae F.L. Stevens, black mildew. Canal Zone.
Irenopsis bayamonensis (Tehon) F.L. Stevens, black mildew. P.R.
Microthyrium psychotriae (Doidge) Toro, black patch. P.R.
Omphalia flavida (Cke.) Maubl. & Rang., leaf spot. P.R.
Puccinia fallaciosa Arth., rust (II,III). P.R.

PTELEA (RUTACEAE)

PTELEA TRIFOLIATA L., HOP-TREE. Deciduous shrub or small tree of Growth Regions 11,16,17,20,22,23,24,25,27,28,29; grown for ornament, Zone IV.

Cercospora afflata Wint. and C. pteleae Wint., leaf spot. Ind., Mo.
Mycosphaerella sp., on leaves. Texas.
Phleospora pteleae Tharp, leaf spot. Texas.
Phyllosticta pteleicola Tehon & Daniels, leaf spot. Ill.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Puccinia windsoriae Schw., rust (O,I). N.Y. to Ala. & Kans. II and III on Poaceae (Tridens flavus (L.) Hitchc.)
Septoria pteleae Ell. & Ev., leaf spot. Ind., Wis.

PUNICA (PUNICACEAE)

PUNICA GRANATUM L., POMEGRANATE. Partly deciduous shrub or small tree of the Mediterranean region, cult. for ornament & fruit, Zone VII. A dwarf var. nana (L.) Pers., is hardy in Zone VI.

Alternaria sp., fruit rot. Calif.
Aspergillus niger Tiegh. (Sterigmatocystis castanea Patters.), internal rot. Ariz., Calif., Texas.
Botrytis cinerea Pers., gray mold rot. Cosmopolitan.
Cercospora lythracearum Heald & Wolf, leaf blotch. Conidial stage of Mycosphaerella lythracearum.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Colletotrichum sp. (? gloeosporioides Penz.), anthracnose, fruit spot. Fla., P.R.
Corticium stevensii Burt, thread blight. Fla.
Heterodera marioni (Cornu) Goodey, root knot. Miss.
Mycosphaerella lythracearum Wolf (Cercospora lythracearum Heald & Wolf), leaf blotch, fruit spot. Fla. to Miss., Texas.
Nematospora coryli Peg., dry rot of fruit. Calif.
Penicillium expansum Lk. ex Thom, blue mold rot. Cosmopolitan.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

PYRACANTHA (ROSACEAE)

PYRACANTHA COCCINEA Roem., FIRETHORN. Large evergreen shrub of S. Europe to W. Asia, cult. for ornament, Zone VI, locally naturalized in Growth Regions 27, 28, 29. The var. LALANDII Dipp. is hardier and more commonly seen in cult. P. ANGUSTIFOLIA (Franch.) Schneid., P. CRENULATA (Roxb.) Roem and P. CRENATO-SERRATA (Hance) Rehd. of C. to S.W. Asia also are cult. in the same range.

Armillaria mellea Vahl ex Fr., root rot. Calif.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., canker. Miss.
Diplodia ? crataegi Westend. (=D. sarmentorum Fr.), twig blight. Pa.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Widespread. (Infects all spp. named but some are relatively resistant.)
Fusicladium pyracanthae (Otth.) Rostr., scab (on leaves & fruit). Widespread.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Septobasidium cokeri Couch and S. mariani Bres., on scale insects infesting bark. N.J.

PYRUS (ROSACEAE)

PYRUS spp. (other than P. communis and its hybrids). Chiefly Asiatic spp. of small, deciduous trees grown in U.S. for ornament or understocks for pear, as P. betulaefolia Bge., P. calleryana Dcne., P. salicifolia Pall., P. ussuriensis Maxim.; hardy in Zones IV or V.

Erwinia amylovora (Burr.) Winslow et al., fire blight. Occasional in Ill., N.Y., Va. but very resistant.
Fabraea maculata Atk., leaf spot. Va.
Gymnosporangium nootkatense (Trel.) Arth., leaf rust (O,I). On P. betulaefolia. Alaska. II and III on Chamaecyparis nootkatense (Lam.) Spach.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Md.

PYRUS COMMUNIS L., PEAR. Tree of Europe & W. Asia, cult. for fruit, Zone IV.

Alternaria sp. (A. mali Roberts), black mold rot of fruit, leaf spot. Occasional in West.
Armillaria mellea Vahl ex Fr., root rot. Widespread.
Aspergillus spp. (A. flavus Lk., A. pyri English), storage rot. Cosmopolitan.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., black rot of fruit. Va.
Botrytis cinerea Pers., gray mold rot, blossom blight, twig blight. Widespread.
Cephalosporium carpogenum Ruehle, storage rot. Oregon, Wash.
Cephalothecium roseum Cda., pink mold rot. Occasional.
Cercospora spp., leaf spot. C. minima Tr. & Earle, Fla. to Texas; C. pyri Farl., Mich.
Cladosporium sp. (C. herbarum Lk.), green mold rot. Occasional.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. La.
Coniothyrium pyrina (Sacc.) Sheldon, leaf spot. Mass. to Ala. Texas & Iowa. (Possibly identical with C. tirolense Bubak.)
Corticium koleroga (Cke.) Höhn., thread blight. La., N.Car.
C. stevensii Burt, N.Car. to Fla. & Texas; W. Va.
C. salmonicolor Berk. & Br., twig blight. Fla., La.
Coryneum foliicolum Fckl., leaf spot. Ind.
C. microstictum Berk. & Br. and C. longistipitatum Berl. on twigs. Fla., N.J.
Cylindrocarpon spp. (C. magnusianum Wr., C. radicicola Wr., C. obtusisporum (Cke. & Harkn.) Wr.), on branches associated with cankers. Conidial stages of Nectria spp.
Cytospora spp., canker. Oregon, Va., Wash.
Diplodia spp., on twigs & branches. (D. maura Cke. & Ell., Ala., Kans., N.J.; D. pyrenophora Fr., N.J.; D. sarmentorum Fr., Oregon)
Entomosporium maculatum Lév., leaf spot. Conidial stage of Fabraea maculata.
Erwinia amylovora (Burr.) Winslow et al., fire blight. General on P. communis vars. but some communis x pyrifolia hybrids are resistant.
E. carotovora (Jones) Holland, fruit rot. Mass.
Fabraea maculata Atk., leaf blight, black spot of fruit. General.
Fomes igniarius (L. ex Fr.) Kickx, white heart rot. Occasional.
F. pinicola (Sw. ex Fr.) Cke.
Fusarium spp., twig blight, canker. Occasional. (Spp. reported include F. acuminatum Ell. & Ev., F. avenaceum (Fr.) Sacc., F. lateritium Nees, F. sambucinum Fckl.)

PYRUS -- continued.

Fusicladium pyrinum (Lib.) Fckl., scab. Conidial stage of Venturia pyrina.
Gloeodes pomigena (Schw.) Colby, sooty blotch. Eastern States to Okla. & Texas.
Gloeosporium sp. (conidial stage of Glomerella cingulata), fruit rot. Widespread.
G. malicorticis Cordley. Conidial stage of Neofabraea malicorticis.
G. perennans Zeller & Childs. Conidial stage of Neofabraea perennans.
Glomerella cingulata (Ston.) Spauld. & Schrenk, bitter rot (fruit), twig & branch canker. Widespread but not destructive.

Gymnosporangium clavipes Cke. & Pk., rust (O, I) chiefly on fruit. La. Texas. III on Juniperus communis L. & J. virginiana L.
G. clavariaeforme (Jacq.) DC., rust (O,I) on leaves & fruit. S.Car. III on Juniperus communis L.
G. globosum Farl., rust (O,I) on leaves & fruit. Eastern States to Iowa & Minn. III on Juniperus virginiana L.
G. kernianum Bethel, rust (O,I) on leaves. Ariz. III on Juniperus occidentalis Hook. and J. pachyphlaea Torr.
G. libocedri (P. Henn.) Kern, rust (O,I) on leaves & fruit. Calif., Oregon. III on Libocedrus decurrens.
G. nelsoni Arth., rust (O,I) on leaves & fruit. Ariz., Colo. III on Juniperus spp.
Helminthosporium papulosum Berg, bark canker. Miss.
Hendersonia cydoniae Cke. & Ell., leaf spot. N.Y.
H. foliorum Fckl. Texas
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly-speck. Eastern States.
Monilinia fructicola (Wint.) Honey, brown rot. Eastern States.
M. laxa (Aderh. & Ruhl.) Honey, brown rot, blossom blight. Pacific Coast States.
Mycosphaerella sentina (Fr.) Schroet. (Septoria pyricola Desm.), ashy leaf spot, fruit spot. Widespread, chiefly in the East.
M. tulasnei (Jancz.) Lindau, Oregon, Wash.
Myxosporium corticolum Edg. (Cryptosporiopsis corticola (Edg.) Nannf.), bark canker. N.Y. to Mich. & Miss., Oregon. Conidial stage of Pezicula corticola (Jörg.) Nannf.
Nectria cinnabarina (Tode ex Fr.), coral spot, dieback. Widespread.
N. galligena Bres., trunk canker. Oregon, Wash.
Neofabraea malicorticis Jacks. (Pezicula malicorticis (Jacks.) Nannf.) black-spot canker. Oregon, Wash.
N. perennans Kienholz (Gloeosporium perennans Zeller & Childs), perennial canker. Oregon, Wash.
Neurospora sitophila Shear & Dodge, ripe rot. N.Car.
Nummularia discreta (Schw.) Tul., blister canker. Del., Iowa.
Penicillium spp., blue mold rot. Widespread. Spp. reported include P. chrysitis Biourge, P. cyclopium Westling, P. expansum Lk. ex Thom, P. puberulum Bainier, P. roquefortii Thom, P. terrestre Jensen.

PYRUS -- continued.

Phoma exigua Desm. and P. mali Schultz & Sacc., storage rot. Wash.
Phomopsis ambigua (Sacc.) Trav., twig blight. Widespread (Conidial stage of Diaporthe ambigua Nits. = D.eres Nits.).
P. mali Roberts, bark canker. Calif.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
P. flavescens var. macrophyllum Engel. Ariz., N.Mex.
(Phyllosticta pirina Sacc.): Coniothyrium pyrina.
P. pyrorum Cke., leaf spot. Ill., Miss., S.Car.
P. solitaria Ell. & Ev. Md.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas & Okla. to Ariz.
Physalospora obtusa (Schw.) Cke., black rot, leaf spot, canker. Widespread. P. fusca N.E. Stevens and P. rhodina (Berk. & Curt.) Cke. also reported from N.J. & Va.
Phytomonas syringae (Van Hall) Bergey et al., blossom & twig blight, canker. Ark., Calif.
P. tumefaciens (EFS. & Town.) Bergey et al., crown gall. General.
Phytophthora cactorum (Leb. & Cohn) Schroet., collar rot, fruit rot. Widespread.
P. citrophthora (R.E. & E.H.Smith) Leonian, collar rot. Calif.
Pleospora fructicola Ruehle, storage rot. Wash.
Podosphaera leucotricha (Ell. & Ev.) Salm., powdery mildew. Colo., Oregon, Wash.
P. oxyacanthae (DC.) DBy. N.J.
Polyporus spp., trunk rot, sometimes wound rot or heart rot of living trees. Spp. reported include P. gilvus (Schw.) Fr., Ind., N.Y.; P. lacteus Fr.; P. squamosus Huds. ex Fr.; P. sulphureus Bull. ex Fr.; P. versicolor L. ex Fr., widespread; P. zonatus Fr., Oregon.
Pratylenchus pratensis (DeMan) Filip., in roots, associated with littleleaf. Calif.
Rhizopus nigricans Ehrh., black mold rot. Cosmopolitan.
Sclerotinia spp., brown rot. See Monilinia.
S. sclerotiorum (Lib.) DBy., fruit rot. Calif., Wash.
Schizophyllum commune Fr., trunk rot, sometimes of living trees. Cosmopolitan.
Septobasidium spp., on scale insects infesting bark. N.Car. to Fla. & Texas. Spp. reported include S. burtii Lloyd, S. curtisii (Berk. & Desm.) Boed. & Stein., S. pseudopedicellatum Burt, S. retiforme (Berk. & Curt.) Pat.
Septoria piricola Desm., leaf spot. Conidial stage of Mycosphaerella sentina.
Sphaeropsis malorum Pk., black rot. Conidial stage of Physalospora obtusa.
Sporotrichum malorum Kidd & Beaumont, storage rot. Oregon, Wash.
Stereum hirsutum Wulf. ex Fr., trunk rot.
S. purpureum Pers., heart rot, ? silver leaf. N.Y., Oregon.
Valsa leucostoma Pers. ex Fr., twig blight. Wash.
Venturia pyrina Aderh., scab. General.

PYRUS -- continued.

Xylaria sp., root rot. Idaho, Ind.
Physiological diseases.
Bitter pit (possibly identical with cork and drought spot) -- attributed to deficiency or irregularity of moisture supply during growth. Pacific Coast States, N.Y.
Black end -- associated with use of Oriental pear rootstocks and occurring on shallow, poorly drained soil. Pacific Coast States.
Black leaf (sometimes associated with rough bark) -- undet. Calif.
Brown bark spot (? measles) -- undet., possibly nutritional deficiency. Pacific Northwest, Fla., Ind.
Brown blotch (of fruit, especially Kieffer var.) -- undet. Eastern States.
Chlorosis -- mineral deficiency, soil alkalinity. Texas, Pacific Coast States.
Core breakdown, brown heart (chiefly in stored fruit) -- overmaturity.
Cork, drought spot -- boron deficiency. Pacific Coast States, Texas.
Exanthema -- copper deficiency. Calif., Fla.
Little leaf, rosette -- nutritional deficiency, ? zinc or boron. Calif., Wash. (Sometimes associated with root infestation by Pratylenchus pratensis.)
Marginal leaf blight, leaf scorch -- nutritional deficiency, ? calcium or potassium. Idaho, Wash.
Red leaf (especially in Oriental pear hybrids) -- undet. but probably a general response to adverse growing conditions.
Rough bark -- undet. Calif., Wash.
Scald (discoloration of stored fruit) -- immaturity, deficient ventilation.
Stigmonose -- insect punctures during growth of fruit. Widespread.
Target canker (? brown bark spot, measles) -- undet. Ga., N.Y., Va.; ?Calif., Wash.
Virus diseases.
Stony pit -- Marmor pyri Holmes. Pacific Coast States.

PYRUS PYRIFOLIA (Burm.) Nakai (P. serotina Rehd., P. sinensis auth.), SAND PEAR. Chinese tree sometimes cult. for fruit, Zone V. P. LECONTEI (P. pyrifolia x communis) furnishes the Kieffer, LeConte, and similar vars.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Corticium stevensii Burt, thread blight. Miss.
Erwinia amylovora (Burr.) Winslow et al., fire blight (resistant). Occasional.
Fabraea maculata Atk., leaf blight. La., Md., Miss., N.Y.
Glomerella cingulata (Ston.) Spauld. & Schrenk, bitter rot. Miss.

PYRUS -- continued.

Gymnosporangium clavipes Cke. & Pk., rust (O,I). Ark.
G. haraeanum Syd., leaf rust (O,I). Calif., Oregon. III on Juniperus chinensis.
Monilinia fructicola (Wint.) Honey, brown rot. Va.
Mycosphaerella pyrina (Ell. & Ev.) Miller, on leaves. Ga.
M. sentina (Fr.) Schroet., leaf spot. Kans., Miss., Texas.
Physalospora obtusa (Schw.) Cke., black rot. Miss.
Phytomonas syringae (Van Hall) Bergey et al., canker. Calif.
Tryblidiella fusca (Ell. & Ev.) Rehm, on dead branch, possibly wound-parasitic. Fla.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

GRASS DISEASES IN MICHIGAN IN 1941

John R. Hardison

This is the second consecutive, annual report of the grass diseases occurring in Michigan. The writer's grass nursery served as a basis for the report augmented by additional collections in southern Michigan. Crown rust (Puccinia coronata) and leaf rust (Puccinia poae-sudeticae) were noted to be less in evidence, but most other diseases were observed to be more prevalent and more serious than in 1940. Stagonospora bromi caused a serious spotting of leaves, sheaths and stems of several species of Bromus and was by far the most destructive disease of brome grasses observed. This disease reached an epiphytotic development, although it has been more or less unreported for the United States. The rust parasite (Darluca filum) was very prevalent on crown rust (Puccinia coronata), stem rust (Puccinia graminis), brown stripe rust (Puccinia montanensis), Poa leaf rust (Puccinia poae-sudeticae), and leaf rust (Puccinia rubigo-vera). In the case of stem rust, at least notable reductions in rust development were apparently caused by this parasite. Furthermore, numerous cases of unusual leaf and stem spot symptoms were found to be due to heavily parasitized stem rust infections, which in some instances were able to sporulate only very slightly or not at all. Powdery mildew (Erysiphe graminis) was very serious on Poa palustris during May and June resulting in the complete killing of the current growth. Only slight recovery was made during the fall rains. Piricularia grisea and Cercospora setaricola together caused considerable defoliation of Setaria lutescens in several fields being used for forage. The bends disease is reported for the first time on Bromus arvensis, B. japonicus, B. mollis, B. secalinus var. velutinus, B. tectorum var. glabratus, Hordeum murinum, Poa pratensis, and Scleropoa rigida.

The writer is indebted especially to Dr. Roderick Sprague and Dr. George W. Fischer for assistance in determination of the Fungi Imperfecti and Ustilaginales respectively, to Mr. Jason Swallen for checking the identity of the majority of the grasses here reported, and to Dr. E.B. Mains for invaluable suggestions. The specimens of Physarum cinereum were contributed by Mr. Walter Kleinschmidt. Thanks are also due to Dr. H. W. Johnson for checking this report.

HOST INDEX

Aegilops crassa Boiss.
Leaf rust, Puccinia rubigo-vera
Scab (head mold), Fusarium sp.

Aegilops triuncialis L.
Leaf rust, Puccinia rubigo-vera

Agropyron caninum (L.) Beauv.
Ergot, Claviceps purpurea

Agropyron cristatum (L.) Gaertn.
Ergot, Claviceps purpurea
Tar spot, Phyllachora graminis

Agropyron desertorum Schult.
Ergot, Claviceps purpurea

Agropyron inerme (Scribn. and Smith) Rydb.
Brown stripe rust, Puccinia montanensis
Leaf rust, Puccinia rubigo-vera
Leaf spot, Helminthosporium sp.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Agropyron repens (L.) Beauv.
Ergot, Claviceps purpurea
Leaf blotch, Helminthosporium tritici-repentis
Leaf rust, Puccinia rubigo-vera, and with parasite, Darluca filum
Leaf spot, Phleospora sp.
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis

Agropyron semicostatum (Steud.) Nees ex. Boiss
Ergot, Claviceps purpurea

Agropyron sibiricum (Willd.) Beauv.
Crown rust, Puccinia coronata, and with parasite, Darluca filum
Ergot, Claviceps purpurea
Leaf rust, Puccinia rubigo-vera
Leaf spot, Ascochyta agropyrina
Stem rust, Puccinia graminis

Agropyron smithii Rydb.
Ergot, Claviceps purpurea
Leaf spot, Septoria nodorum
Stem rust, Puccinia graminis

Agropyron spicatum (Pursh) Scribn.
Brown stripe rust, Puccinia montanensis
Leaf rust, Puccinia rubigo-vera
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Agropyron striatum (Steud.) Nees ex Hook.
Ergot, Claviceps purpurea
Stem rust, Puccinia graminis

Agropyron subsecundum (Link) Hitchc.
Brown stripe rust, Puccinia montanensis
Stem rust, Puccinia graminis

Agropyron trachycaulum (Link) Malte (Agropyron pauciflorum (Schwein.) Hitchc.)
Brown stripe rust, Puccinia montanensis
Head smut, Ustilago bullata
Leaf rust, Puccinia rubigo-vera, and with parasite, Darluca filum
Leaf spot, Stagonospora arenaria
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Agrostis alba L.
Leaf rust, Puccinia rubigo-vera
Leaf spot, Colletotrichum graminicolum

Agrostis palustris Huds.
Leaf rust, Puccinia rubigo-vera

Agrostis scabra Willd.
Stem rust, Puccinia graminis

Agrostis stolonifera L.
Stem rust, Puccinia graminis

Alopecurus pratensis L.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Andropogon furcatus Muhl.
Leaf rust, Puccinia ellisiana

Andropogon scoparius Michx.
Leaf rust, Puccinia ellisiana
Tar spot, Phyllachora graminis

Arrhenatherum elatius (L.)Mert.&Koch.
Leaf spot, Stagonospora arrhenatheri Sm. and Ramsb.

Avena fatua L.
Bends, Cause undetermined

Beckmannia erucaeformis (L.) Host
Stem rust, Puccinia graminis, with parasite, Darluca filum

Bromus arvensis L.
Bends, cause undetermined
Crown rust, Puccinia coronata
Stem rust, Puccinia graminis, with parasite, Darluca filum

Bromus breviaristatus Buckl.
Leaf spot, Stagonospora bromi
Head smut, Ustilago bullata
Stem rust, Puccinia graminis

Bromus carinatus Hook. and Arn.
Leaf spot, Helminthosporium bromi
Leaf spot, Stagonospora bromi

Bromus catharticus Vahl.
Bends, cause undetermined
Head smut, Ustilago bullata

Bromus ciliatus L.
Leaf spot, Helminthosporium sp.

Bromus inermis Leyss.
Ergot, Claviceps purpurea
Leaf, stem and sheath spot, Stagonospora bromi

Bromus japonicus Thunb.
Bends, cause undetermined
Crown rust, Puccinia coronata
Leaf spot, Helminthosporium bromi

Bromus macrostachys L.
Crown rust, Puccinia coronata

Bromus marginatus Nees
Crown rust, Puccinia coronata
Head smut, Ustilago bullata
Leaf spot, Helminthosporium bromi
Leaf stem and sheath spot, Stagonospora bromi
Stem rust, Puccinia graminis

Bromus mollis L.
Bends, cause undetermined
Leaf spot, Helminthosporium sp.

Bromus polyanthus Scribn.
Crown rust, Puccinia coronata
Head smut, Ustilago bullata

Bromus purgans L.
Crown rust, Puccinia coronata
Head smut, Ustilago bullata
Leaf spot, Helminthosporium bromi

Bromus rubens L.
Crown rust, Puccinia coronata

Bromus secalinus var. velutinus (Schrad.) Koch
Bends, cause undetermined

Bromus tectorum var. glabratus Spenner
Bends, cause undetermined

Calamagrostis canadensis (Michx.)Beauv.
Leaf rust, Puccinia pygmaea

Dactylis glomerata L.
Ergot, Claviceps purpurea
Brown stripe, Scolecotrichum graminis
Leaf spot, Stagonospora arenaria
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis, with parasite, Darluca filum

Deschampsia caespitosa (L.) Beauv.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Digitaria ischaemum (Schreb.) Muhl.
Ustilago rabenhorstiana

Digitaria sanguinalis (L.) Scop.
Leaf and culm disease, Colletotrichum graminicolum

Echinochloa crusgalli (L.) Beauv.
Leaf spot, Epicoccum sp.

Elymus canadensis L.
Brown stripe rust, Puccinia montanensis, and with parasite, Darluca filum.
Crown rust, Puccinia coronata
Ergot, Claviceps purpurea
Head smut, Ustilago bullata
Leaf rust, Puccinia rubigo-vera, with parasite, Darluca filum
Brown stripe, Scolecotrichum graminis
Leaf spot, Stagonospora arenaria

Elymus canadensis var. robustus (Scribn. and Smith) Mac kenz. and Bush
Brown stripe rust, Puccinia montanensis
Powdery mildew, Erysiphe graminis

Elymus condensatus Presl.
Brown stripe rust, Puccinia montanensis
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Elymus dahuricus Turcz.
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis

Elymus glaucus Buckl.
Brown stripe rust, Puccinia montanensis, and with parasite, Darluca filum
Leaf spot, Septoria elymi
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Elymus sibiricus L.
Brown stripe rust, Puccinia montanensis, with parasite, Darluca filum
Stem rust, Puccinia graminis

Elymus triticoides Buckl.
Leaf rust, Puccinia rubigo-vera

Elymus villosus Muhl.
Stem rust, Puccinia graminis

Elymus virginicus L.
Brown stripe rust, Puccinia montanensis
Ergot, Claviceps purpurea
Leaf spot, Stagonospora arenaria
Stem rust, Puccinia graminis
Tar spot, Phyllachora graminis

Elymus virginicus var. intermedius (Vasey) Bush
Brown stripe rust, Puccinia montanensis

Festuca idahoensis Elmer
Stem rust, Puccinia graminis with parasite, Darluca filum

Holcus lanatus L.
Leaf spot, Helminthosporium sp.

Hordeum bulbosum L.
Stem rust, Puccinia graminis with parasite, Darluca filum

Hordeum jubatum L.
leaf rust, Puccinia rubigo-vera
Stem rust, Puccinia graminis

Hordeum jubatum var. caespitosum (Scribn.) Hitchc.
Stem rust, Puccinia graminis

Hordeum murinum L.
Bends, cause undetermined
Stem rust, Puccinia graminis

Hordeum nodosum L.
Stem rust, Puccinia graminis

Hystrix patula Moench
Leaf rust, Puccinia rubigo-vera
Tar spot, Phyllachora graminis

Koeleria cristata (L.) Pers.
Bends, cause undetermined
Stem rust, Puccinia graminis with parasite, Darluca filum

Leersia oryzoides (L.) Swartz
Uromyces halstedii

Lolium multiflorum Lam.
Brown stripe rust, Puccinia montanensis

Lolium perenne L.
Ergot, Claviceps purpurea
Stem rust, Puccinia graminis

Millium effusum L.
Culm disease, Colletotrichum graminicolum

Phleum pratense L.
Brown stripe, Scolecotrichum graminis
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Poa ampla Merr.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Poa arida Vasey
Stem rust, Puccinia graminis

Poa canbyi (Scribn.) Piper
Stem rust, Puccinia graminis with parasite, Darluca filum

Poa compressa L.
Brown stripe, Scolecotrichum graminis
Stem rust, Puccinia graminis

Poa juncifolia Scribn.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Poa palustris L.
Powdery mildew, Erysiphe graminis

Poa nevadensis Vasey
Stem rust, Puccinia graminis with parasite, Darluca filum

Poa pratensis L.
Bends, cause undetermined
Leaf mold, Physarum cinereum
Leaf rust, Puccinia poae-sudeticae, and parasite, Darluca filum
Leaf spot, Helminthosporium vagans
Leaf spot, Septoria macropoda var. septulata
Leaf spot, Septoria oudemansii
Powdery mildew, Erysiphe graminis
Stripe smut, Urocystis agropyri

Poa stenantha Trin.
Brown stripe, Scolecotrichum graminis

Puccinellia distans (L.) Parl.
Stem rust, Puccinia graminis, with parasite, Darluca filum

Scleropoa rigida (L.) Griseb.
Bends, cause undetermined

Setaria lutescens (Weigel) F.T. Hubb
Leaf spot, Cercospora setaricola
Leaf spot, Piricularia grisea

Setaria viridis (L.) Beauv.
Leaf spot, Piricularia grisea

Sitanion hystrix (Nutt.) J. G. Smith
Stem rust, Puccinia graminis

Sitanion jubatum J. G. Smith
Stem rust, Puccinia graminis

Sorghum vulgare Pers.
Smut, Sphacelotheca sorghi (Link) Clinton

Trisetum flavescens (L.) Beauv.
Culm disease, Colletotrichum graminicolum

PATHOGEN INDEX

Cause undetermined

Bends [1/]
- Avena fatua
- Bromus arvensis
- Bromus japonicus
- Bromus mollis
- Bromus secalinus var. velutinus
- Bromus tectorum var. glabratus
- Hordeum murinum
- Koeleria cristata
- Poa pratensis
- Scleropoa rigida

Myxomycetes

Physarum cinereum Pers. [2/]
- Poa pratensis

Ascomycetes

Claviceps purpurea (Fr.) Tul.
- Agropyron caninum
- Agropyron desertorum
- Agropyron repens
- Agropyron semicostatum
- Agropyron sibiricum
- Agropyron smithii
- Agropyron striatum
- Bromus inermis
- Dactylis glomerata
- Elymus canadensis
- Lolium perenne

Erysiphe graminis DC.
- Agropyron repens
- Dactylis glomerata
- Elymus canadensis var. robustus
- Elymus dahuricus
- Poa palustris
- Poa pratensis

Phyllachora graminis (Pers.) Fckl.
- Agropyron cristatum
- Andropogon scoparius
- Elymus virginicus
- Hystrix patula

Fungi Imperfecti

Ascochyta agropyrina (Fair.) Tr.
- Agropyron sibiricum

Cercospora setaricola Tehon and Daniels
- Setaria lutescens

Colletotrichum graminicolum (Ces.) Wils.
- Agrostis alba
- Digitaria sanguinalis
- Millium effusum
- Trisetum flavescens

Darluca filum (Biv.) Cast
With Puccinia coronata on:
- Agropyron sibiricum

Darluca filum (Biv.) Cast--continued
With Puccinia graminis on:
- Agropyron inerme
- Agropyron spicatum
- Agropyron trachycaulum
- Alopecurus pratensis
- Beckmannia erucaeformis
- Bromus arvensis
- Dactylis glomerata
- Deschampsia caespitosa
- Elymus condensatus
- Elymus glaucus
- Festuca idahoensis
- Hordeum bulbosum
- Koeleria cristata
- Phleum pratense

Darluca filum (Biv.) Cast--cont'd.
With Puccinia graminis on:
Poa ampla
Poa canbyi
Poa juncifolia
Poa nevadensis
Puccinellia distans

With Puccinia montanensis on:
Elymus canadensis
Elymus glaucus
Elymus sibiricus

With Puccinia poae-sudeticae on:
Poa pratensis

With Puccinia rubigo-vera on:
Agropyron repens
Agropyron trachycaulum
Elymus canadensis

Epicoccum sp.
Echinochloa crusgalli

Fusarium sp.
Aegilops crassa

Helminthosporium bromi Diedicke
Bromus carinatus
Bromus japonicus
Bromus marginatus
Bromus purgans

Helminthosporium tritici-repentis Died.
Agropyron repens

Helminthosporium vagans Drechs.
Poa pratensis

Helminthosporium spp.
Agropyron inerme
Bromus ciliatus
Bromus mollis
Holcus lanatus

Phleospora sp.
Agropyron repens
Elymus canadensis

Piricularia grisea (Cke.) Sacc.
Setaria lutescens
Setaria viridis

Scolecotrichum graminis Fckl.
Dactylis glomerata
Elymus canadensis
Phleum pratense
Poa compressa
Poa stenantha

Septoria elymi Ell. and Ev.
Elymus glaucus

Septoria macropoda var. septulata (Gz. Fr.) Spr.
Poa pratensis

Septoria nodorum Berk.
Agropyron smithii

Septoria oudemansii Sacc.
Poa pratensis

Stagonospora arenaria Sacc.
Agropyron trachycaulum
Dactylis glomerata
Elymus canadensis
Elymus virginicus

Stagonospora arrhenatheri Sm. and Ramsb.
Arrhenatherum elatius

Stagonospora bromi Sm. and Ramsb.
Bromus breviaristatus
Bromus carinatus
Bromus inermis
Bromus marginatus

Ustilaginales

Urocystis agropyri (Preuss) Schroet.
- Poa pratensis

Ustilago bullata Berk.
- Agropyron trachycaulum
- Bromus catharticus
- Bromus marginatus
- Bromus polyanthus
- Bromus purgans
- Elymus canadensis

Ustilago neglecta Niessl
- Setaria lutescens

Ustilago rabenhorstiana Kühn
- Digitaria ischaemum

Sphacelotheca sorghi (Link) Clinton
- Sorghum vulgare

Uredinales

Puccinia coronata Cda.
- Agropyron sibiricum
- Bromus arvensis
- Bromus japonicus
- Bromus macrostachys
- Bromus marginatus
- Bromus polyanthus
- Bromus purgans
- Bromus rubens
- Elymus canadensis

Puccinia ellisiana Thüm.
- Andropogon furcatus
- Andropogon scoparius

Puccinia graminis Pers.
- Agropyron inerme
- Agropyron repens
- Agropyron sibiricum
- Agropyron spicatum
- Agropyron striatum
- Agropyron subsecundum
- Agropyron trachycaulum
- Agrostis scabra
- Agrostis stolonifera
- Alopecurus pratensis
- Beckmannia erucaeformis
- Bromus arvensis
- Bromus breviaristatus
- Bromus marginatus
- Bromus vulgaris
- Dactylis glomerata
- Deschampsia caespitosa
- Elymus condensatus
- Elymus dahuricus
- Elymus glaucus

Puccinia graminis Pers. -- continued
- Elymus sibiricus
- Elymus villosus
- Elymus virginicus
- Festuca idahoensis
- Hordeum bulbosum
- Hordeum jubatum
- Hordeum jubatum var. caespitosum
- Hordeum murinum
- Hordeum nodosum
- Koeleria cristata
- Lolium perenne
- Phleum pratense
- Poa ampla
- Poa arida
- Poa canbyi
- Poa compressa
- Poa nevadensis
- Puccinellia distans
- Sitanion hystrix
- Sitanion jubatum

Puccinia montanensis Ellis
- Agropyron inerme
- Agropyron spicatum
- Agropyron subsecundum
- Agropyron trachycaulum
- Elymus canadensis
- Elymus canadensis var. robustus
- Elymus condensatus
- Elymus glaucus
- Lolium multiflorum

Puccinia poae-sudeticae (Westend.) Jørstad
- Poa pratensis

Puccinia pygmaea Erikss.
Calamagrostis canadensis

Puccinia rubigo-vera (DC.) Wint.
Aegilops crassa
Aegilops triuncialis
Agropyron inerme
Agropyron repens
Agropyron sibiricum
Agropyron spicatum
Agropyron trachycaulum

Puccinia rubigo-vera (DC.) Wint.--continued
Agrostis alba
Agrostis palustris
Elymus canadensis
Elymus junceus
Elymus triticoides
Hordeum jubatum
Hystrix patula

Uromyces halstedii De-T.
Leersia oryzoides

Notes:
1/Bends refers to the disease discovered and described by Dr. G. W. Fischer, Phytopathology 31(7): 674-676, 1941. This disease was first reported for the Midwest by the writer, Plant Disease Reporter 25(4): 120-125, 1941.

2/Physarum cinereum caused a smothering of Poa pratensis in lawns resulting in complete killing of the current foliage in several small areas. (UNIVERSITY OF MICHIGAN, DEPARTMENT OF BOTANY).

BRIEF NOTES ON PLANT DISEASES

PHYLLACHORA FUSICARPA IN FLORIDA: A specimen of Duranta leaves, species unknown, heavily infected by an immature Phyllachora was found in the vicinity of the Bok Tower at Lake Wales, Florida, on March 23, 1939 by D. R. Sumstine. Although immature, the fungus appears superficially to be identical with a mature specimen found in Haiti on Duranta erecta L. in 1925 by E. C. Leonard, identified as Phyllachora fusicarpa Seaver. This species was based upon specimens upon Duranta repens L. from Nassau in the Bahamas and from Rio Piedras in Puerto Rico described in 1920 in Britton & Millspaugh's Bahama Flora (p.633). A related species, Phyllachora durantae Rehm (Hedw. 31, p.306, 1892), described with much smaller ascospores than P. fusicarpa, is based on material from an unknown species of Duranta in Ecuador, but specimens are not available for comparison and that species appears to have been unrecognized since the original finding. It would seem likely that the Florida fungus may have been imported with the host from some West Indian source. (William W. Diehl, Division of Mycology and Disease Survey).

DESTRUCTIVE OCCURRENCE OF DIPLODIA ON OKRA STALKS IN ALABAMA: My assistant, who is working with fiber investigations, brought in a piece of okra stalk badly affected by the fungus Diplodia natalensis Pole Evans. The disease is so destructive that it has literally ruined the fiber, and discolored the interior as well. A large quantity of these stalks stacked outside are black with this fungus. I have never seen it so bad before. Evidently the okra stalks will have to be put in a dry place when cut to prevent damage to the fiber from this organism. (G. W. Carver, Tuskegee Institute, Alabama).

SPREAD OF WHITE PINE BLISTER RUST DURING 1941

Division of Plant Disease Control
Bureau of Entomology and Plant Quarantine

The spread of white pine blister rust [Cronartium ribicola] during 1941 was featured by a southward extension of the disease on Ribes from central Virginia and West Virginia into northern Tennessee and North Carolina, and by the finding for the first time of large numbers of cankers on sugar pine in northern California and southern Oregon in localities where Ribes were found infected in previous years.

In the Appalachinan region, the rust spread southward on wild Ribes for a distance of about 134 miles. Counties in which infection was found for the first time are Mercer, Monroe, Raleigh, and Summers in West Virginia; Bland, Giles, Grayson, Pulaski, Smyth, and Wythe in Virginia; Ashe, Avery, McDowell, and Wautauga in North Carolina and Carter and Johnson in Tennessee. In West Virginia there were 8 new centers of Ribes infection, in Virginia 8, in North Carolina 17, and in Tennessee 2, making a total of 35 in the 16 counties. The larger number of centers found in North Carolina probably is the result of more extensive scouting in that State to determine the southern limit of spread. Ribes americanum was found infected at 1 point, R. cynosbati at 19, and R. rotundifolium at 10. In Virginia, pine infections were found for the first time at 9 places in Bath County and 1 in Shenandoah County. Some of the new infections are within the boundaries of the purchase units of the Jefferson National Forest in Virginia, the Pisgah in North Carolina, and the Cherokee in Tennessee.

The southward extension of the rust was expected sooner or later and is not especially serious from a control standpoint, since nearly all of the valuable white pine stands within the newly infected counties already have been initially protected by the eradication of Ribes. This will prevent commercial damage to pine growing within control areas. In most cases the diseased Ribes were found outside the boundaries of control areas, and although white pines were growing nearby in some instances, they were too few and scattered to be of sufficient value to justify control work. Such individual trees or groups of trees are scattered throughout the white pine region of the Southern Appalachian States, and in these unprotected locations some damage and loss of white pine trees from blister rust is expected.

In the sugar pine region of Oregon and California many more blister rust cankers were discovered on sugar pines than have been observed in past years. In southern Oregon the wet season and the increase locally in the volume of aeciospore dispersal resulted in general and heavy infection on Ribes. The rust is now more or less generally present in Oregon in all counties where five-needle pines occur. A pronounced increase in the amount of disease on pines was observed in Josephine and Jackson Counties. In Klamath County infection was found for the first time on both pines and Ribes. Numerous infected sugar pines were located in parts of control units in the Siskiyou National Forest, notably around the Reuben Mountain area. Pine infections also were found this season just outside the Upper Rogue River and Pinehurst control units on the Rogue River National Forest.

The disease was found for the first time in Crater Lake National Park. Infection was confined to the Annie Creek Canyon and was found on both pines and Ribes. Sixteen cankers were located on 8 pines, 7 of them western white, and 1 sugar pine. A total of 150 Ribes were infected, distributed by species as follows: 72 Ribes inerme, 50 R. viscosissimum, 22 R. binominatum, 5 R. lacustre, and 1 R. cereum.

In California, blister rust infections were found for the first time on Ribes in Mendocino and Humboldt Counties in the Coast Range and in Sierra County in the Sierra Nevadas. The rust has thus spread southward in the Coast Range for some 200 miles and in the Sierra Nevada for 170 miles. There was heavy intensification and local spread within some northern counties where Ribes infection was previously very light. All pine infection found in California this year can be attributed to local origin. Ribes infections were limited to the general vicinity of "fruiting" cankers, except those in Mendocino and Humboldt Counties, which may represent spread from a longer distance, as locally white pines are not very plentiful.

Scouting in 1941 extended the known limit of rust spread 6 miles farther south, and the known limits of pine infection about 60 miles farther south in the Sierra Nevadas. In Plumas and Sierra Counties infection on Ribes was found close to the boundary of Yuba County.

Weather conditions on the Klamath National Forest in Siskiyou County were extremely favorable for the establishment and intensification of rust on Ribes. Also, cankers originating in 1937 were sporulating for the first time. As a result of these two conditions there was a general spread of rust in this forest. In view of the widespread and heavy infection on Ribes in the control unit near Hilt, California, the Ribes eradication in progress there was speeded up in order to lessen as much as possible the amount of infection that was returning from Ribes to young sugar pines. Rust intensification was particularly heavy on R. sanguineum. Nearly all bushes of this species were infected and the leaves were literally covered with rust.

Pine infection was discovered for the first time on the Shasta National Forest where 150 sugar pines were found with 603 cankers. The rust, although mostly restricted to stream type, was scattered throughout the Damnation Creek drainage in Shasta County. An interesting observation in this locality was the apparent high resistance to infection of R. roezli. This species, where it occurs in the Sierra Nevadas, is known to be highly susceptible, yet only 3 lightly infected R. roezli bushes out of hundreds examined were found in the Damnation Creek infection area, and these were in the immediate vicinity of sporulating cankers. Numerous infected R. nevadense were located.

On the Lassen National Forest 133 cankers on 80 sugar pines were located in the Montgomery Creek area, and 119 cankers on 73 pines in the Viola area. Only 2 cankers were noted on each of these 2 infection areas in 1940. A few fruiting cankers were found at Montgomery Creek but none at Viola.

The most significant find of the season was the discovery of infected sugar pine near Cascade in the southern end of the Plumas National Forest in Plumas County. Although one infected R. roezli had been located in this area

in 1938, no cankers had been found. In 1941, 28 infected pines containing 74 cankers were located in 4 townships, and rust on Ribes in 2 additional townships. The infected pines were all found along stream bottoms. A few cankers had sporulated, and the resultant Ribes infection was confined mostly to the same stream bottoms.

The discovery of rust on sugar pine so far south in the Sierra Nevadas and the large increase in the number of infected pines, is tangible evidence that the disease is beginning to establish itself over a wide area in northern California. The scouting in this part of the State resulted in the finding of a total of 929 cankers on 331 pines. Prior to this only 4 pines with 4 cankers had been discovered in the Sierra Nevada and Cascade Ranges in California. All pine cankers and all infected Ribes that were located during 1941 in the Sierra Nevada and Cascade Ranges were destroyed to retard the spread of the rust as much as possible.

The past year also appears to have been unusually favorable for rust intensification in the western white pine region of northeastern Washington, northern Idaho and northwestern Montana because of abnormally wet conditions throughout the growing season. Although there is enough pine infection present to cause considerable intensification of the disease every year, these particularly favorable years are apt to result in extensive and serious damage to young growth. This is especially true when numerous cankers formed during a previous wet year produce aeciospores in abundance during another wet year. This happened in 1941, when cankers from the heavy 1937 wave of pine infection reached the "fruiting" stage. As a result, infection was widespread on Ribes even where these bushes occurred in small numbers. The full effect of the exceptionally favorable conditions for rust spread during 1941 in this region cannot be definitely determined until 1943, but it is expected that a large increase in pine infection may take place. Infection on white pines was located for the first time in 1941 in Glacier National Park. Four cankers on 4 western white pine were found near the north end of Lake McDonald. This represents an eastward extension of the known location of pine infection although Ribes infection had been reported previously from Lake McDonald and other areas in Glacier National Park. The results of scouting in Yellowstone and Grand Teton National Parks were negative.

Blister rust infection in the North Central States was found for the first time on white pine in Wabash, Wadena, and Mahnomen Counties, Minnesota; Iron, Dane, and Richland Counties, Wisconsin; and Lake County, Michigan. The rust on either one or both host plants has been previously found in every county in Wisconsin and in all but 3 southern counties in Michigan. It was found on Ribes for the first time in Licking County, Ohio, and Wadena County, Minnesota. In general, weather conditions during the first part of the summer were unsatisfactory for the spread of the rust on Ribes, but after the middle of August they favored the spread of the disease on both host plants. Within the infected area, particularly in the northern part of the region where conditions are more favorable for rust development, there has been considerable recent intensification of the disease on white pine as shown by the number of cankers appearing on 1937 and 1938 wood. This area usually has more precipitation, lower temperatures, and more frequent fogs near the lakes than other parts of the North Central region. Also, there is a more general distribution of Ribes.

NEW BLISTER RUST INFECTIONS FOR 1941
(Infections listed are only those found for the first time in a new county on either pines or Ribes, or both)

Region and State	County	Host Plant: Ribes	Host Plant: Pine	Species	Date
So. Appalachian					
Virginia	Bath		X	Pinus strobus	May
	Bland	X		R. rotundifolium	Sept.
	Giles	X		"	"
	Grayson	X		R. cynosbati	Oct.
	Pulaski	X		R. rotundifolium	Sept.
	Shenandoah		X	P. strobus	May
	Smyth	X		R. cynosbati	Oct.
	Wythe	X		R. rotundifolium	Sept.
West Virginia	Mercer	X		R. cynosbati	Sept.
	Summers	X		"	"
	Monroe	X		"	"
	Raleigh	X		"	Oct.
Tennessee	Carter	X		"	Oct.
	Johnson	X		"	"
North Carolina	Ashe	X		R. cynosbati & amer.	"
	Avery	X		R. rotundifolium	"
	McDowell	X		"	"
	Watauga	X		R. cynosbati	"
North Central					
Minnesota	Wadena		X	P. strobus	Sept.
	Wadena	X		R. cynosbati	"
	Wabasha		X	P. strobus	June
	Mahnomen		X	P. strobus	Aug.
Michigan	Lake		X	"	Dec.
Ohio	Licking	X		R. cynosbati	Sept.
Wisconsin	Iron		X	P. strobus	June
	Dane		X	"	Nov.
	Richland		X	"	Dec.
Sugar Pine:					
California	Mendocino	X		R. menziesii	Dec.
	Humboldt	X		"	"
	Sierra	X		R. roezli	Sept.
	Klamath	X	X	5 Ribes species	"
	Klamath		X	P. lambertiana	Sept.

Blister rust has been prevalent throughout the Northeastern States for many years. The progress of Ribes eradication since 1918 has brought the rust under control over extensive areas where these bushes have been removed and kept suppressed. In 1941 Ribes in general were from moderately to heavily infected in spite of drought conditions which prevailed during most of the field season. A few new pine infection centers were found in some of the States, but these were areas where the disease had been present for several years. The number of new cankers appearing on the pines in protected areas is small. Old infection on white pines is conspicuous in many places but in most of these areas Ribes have been kept suppressed and therefore new infection is absent.

A tabular statement showing by States the counties in which blister rust on pine and Ribes were found for the first time in 1941 is given on page 79.

JANUARY WEATHER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending February 3, 1942.

The weather during January was decidedly abnormal in several respects. Instead of the usual alternating brief periods of relatively cold and warm weather, characteristic of the winter season, nearly the entire first half of the month was persistently cold and the last half abnormally warm. Much of the last 2 weeks of the period was spring-like over large areas of the country.

The cold weather during the first half of the month was unusually severe, with subzero temperatures prevailing everywhere from the Appalachian Mountains westward to the Rockies and reaching as far south as central Virginia, western North Carolina and central Tennessee. A hard freeze penetrated the deep South with minimum temperatures as low as 16° reported from northern Florida.

With the reaction to higher temperatures about the middle of the month the subsequent weather was just as persistently warm with temperatures for 2 weeks in succession averaging from 20° to nearly 30° above normal in considerable northwestern areas. However, the Great Basin of the West experienced subnormal temperatures during nearly the entire month. Precipitation was decidedly scanty in most sections of the country.

Figure 1 shows that the average temperature for the month as a whole was substantially normal from the Appalachian Mountains eastward and decidedly above normal from the Ohio and lower Missouri Valleys and southern Great Plains northward and northwestward. In most of this latter area the monthly means were from 3° to as many as 16° above normal.

On the other hand it was colder than normal from Kentucky and southern Missouri southward and southwestward, and also in central and northern Rocky Mountain sections and the Great Basin of the West. The minus anomalies were substantial in the northern Rocky Mountain area and the northern Great Basin. In the Northwest, there were some striking contrasts in the mean monthly temperatures in contiguous localities. For example, the average at Havre, Montana was 11° above normal and at Helena, Montana 10° below normal.

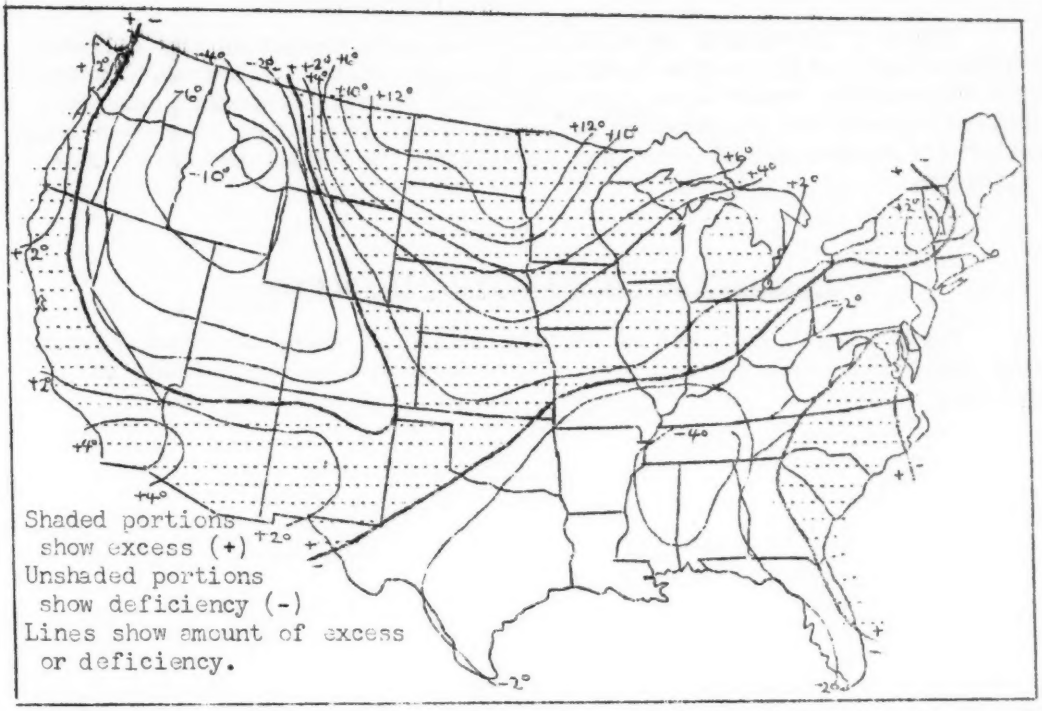

Fig. 1. -- Departure of Mean Temperature from the Normal for January 1942.

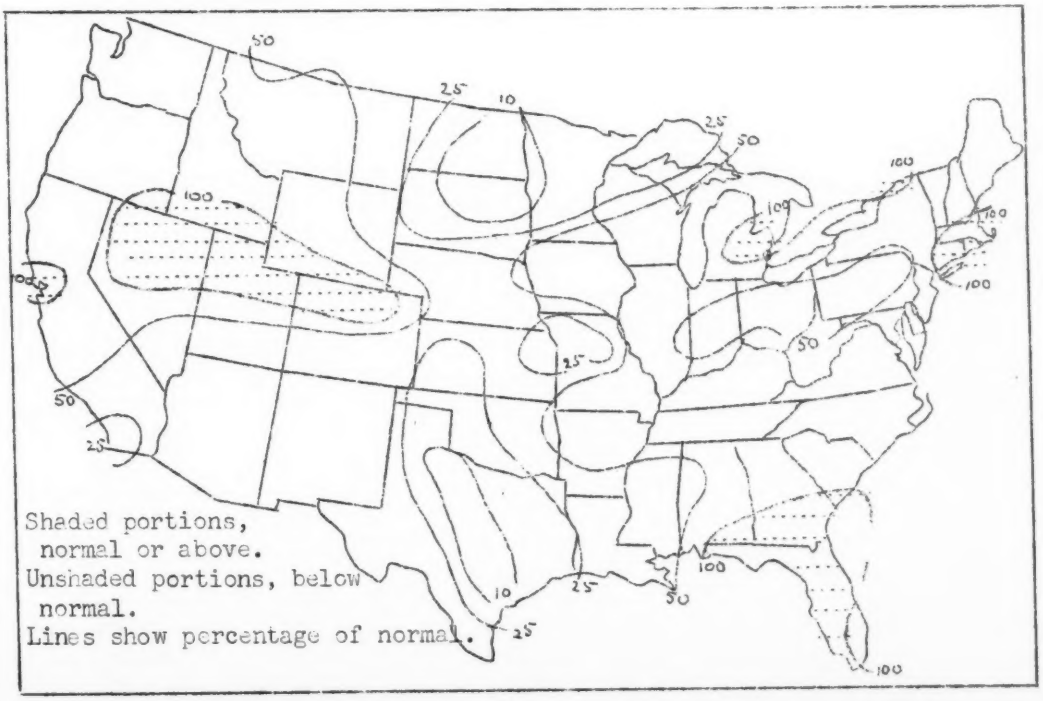

Fig. 2. -- Percentage of Normal Precipitation for January 1942.

Figure 2 shows that precipitation was above normal in the extreme Southeast and locally in the Northeast and more western sections. Otherwise, the monthly totals were generally below normal, markedly so in most sections between the Mississippi River and Rocky Mountains. A considerable area of the Southwest had less than one-fourth the normal amount of precipitation.

A CORRECTION: NO PHONY PEACH IN OKLAHOMA

The report on page 298 of Supplement 128 of phony peach in Oklahoma is an error and should be deleted. Phony peach has not been found in Oklahoma.